PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION CONCERNING TRANSMITTAL OF COPY OF INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (CHAPTER I OF THE PATENT COOPERATION TREATY)
(PCT Rule 44bis.1(c))

To:

TANAKA, Mitsuo
AOYAMA & PARTNERS, IMP Building, 3-7, Shiromi 1-chome, Chuo-ku, Osaka-shi, Osaka
5400001
JAPON

Date of mailing *(day/month/year)* 01 October 2009 (01.10.2009)	
Applicant's or agent's file reference 668154	**IMPORTANT NOTICE**

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/JP2008/055078	19 March 2008 (19.03.2008)	20 March 2007 (20.03.2007)

Applicant
Dainippon Sumitomo Pharma Co., Ltd. et al

The International Bureau transmits herewith a copy of the international preliminary report on patentability (Chapter I of the Patent Cooperation Treaty)

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No. +41 22 338 82 70

Authorized officer
Masashi Honda

e-mail: pt08.pct@wipo.int

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference 668154	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/JP2008/055078	International filing date *(day/month/year)* 19 March 2008 (19.03.2008)	Priority date *(day/month/year)* 20 March 2007 (20.03.2007)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant Dainippon Sumitomo Pharma Co., Ltd.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 8 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☒	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☒	Box No. VIII	Certain observations on the international application

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 22 September 2009 (22.09.2009)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Masashi Honda e-mail: pt08.pct@wipo.int

Form PCT/IB/373 (January 2004)

特 許 協 力 条 約

発信人　日本国特許庁（国際調査機関）

代理人
田中　光雄

様

あて名
〒540-0001
日本国大阪府大阪市中央区城見１丁目３番７号　Ｉ
ＭＰビル　青山特許事務所

ＰＣＴ
国際調査機関の見解書
（法施行規則第40条の2）
〔ＰＣＴ規則43の2.1〕

発送日 （日.月.年）	２２．０４．２００８
出願人又は代理人 の書類記号　668154	今後の手続きについては、下記２を参照すること。

国際出願番号	国際出願日	優先日
ＰＣＴ／ＪＰ２００８／０５５０７８	（日.月.年）　１９．０３．２００８	（日.月.年）　２０．０３．２００７

国際特許分類（ＩＰＣ）Int.Cl. 補充欄参照

出願人（氏名又は名称）
大日本住友製薬株式会社

１．この見解書は次の内容を含む。

- ☑ 第Ⅰ欄　見解の基礎
- ☐ 第Ⅱ欄　優先権
- ☐ 第Ⅲ欄　新規性、進歩性又は産業上の利用可能性についての見解の不作成
- ☐ 第Ⅳ欄　発明の単一性の欠如
- ☑ 第Ⅴ欄　ＰＣＴ規則43の2.1(a)(i)に規定する新規性、進歩性又は産業上の利用可能性についての見解、それを裏付けるための文献及び説明
- ☑ 第Ⅵ欄　ある種の引用文献
- ☐ 第Ⅶ欄　国際出願の不備
- ☑ 第Ⅷ欄　国際出願に対する意見

２．今後の手続き
国際予備審査の請求がされた場合は、出願人がこの国際調査機関とは異なる国際予備審査機関を選択し、かつ、その国際予備審査機関がＰＣＴ規則66.1の2(b)の規定に基づいて国際調査機関の見解書を国際予備審査機関の見解書とみなさない旨を国際事務局に通知していた場合を除いて、この見解書は国際予備審査機関の最初の見解書とみなされる。

この見解書が上記のように国際予備審査機関の見解書とみなされる場合、様式ＰＣＴ／ＩＳＡ／２２０を送付した日から３月又は優先日から２２月のうちいずれか遅く満了する期限が経過するまでに、出願人は国際予備審査機関に、適当な場合は補正書とともに、答弁書を提出することができる。

さらなる選択肢は、様式ＰＣＴ／ＩＳＡ／２２０を参照すること。

３．さらなる詳細は、様式ＰＣＴ／ＩＳＡ／２２０の備考を参照すること。

見解書を作成した日
０７．０４．２００８

名称及びあて先 日本国特許庁（ＩＳＡ／ＪＰ） 郵便番号１００－８９１５ 東京都千代田区霞が関三丁目４番３号	特許庁審査官（権限のある職員） 當麻　博文	４Ｐ　３５４３
	電話番号　０３－３５８１－１１０１　内線　３４９２	

様式ＰＣＴ／ＩＳＡ／２３７（表紙）（２００７年４月）

国際調査機関の見解書

国際出願番号　ＰＣＴ／ＪＰ２００８／０５５０７８

第Ⅰ欄　見解の基礎

1．言語に関し、この見解書は以下のものに基づき作成した。

☑ 出願時の言語による国際出願

☐ 出願時の言語から国際調査のための言語である＿＿＿＿＿＿＿＿語に翻訳された、この国際出願の翻訳文（ＰＣＴ規則12.3(a)及び23.1(b)）

2．☐ この見解書は、ＰＣＴ規則 91 の規定により国際調査機関が認めた又は国際調査機関に通知された明らかな誤りの訂正を考慮して作成した（ＰＣＴ規則 43 の 2.1(b)）。

3．この国際出願で開示されたヌクレオチド又はアミノ酸配列に関して、以下に基づき見解書を作成した。

a．タイプ
- ☐ 配列表
- ☐ 配列表に関連するテーブル

b．フォーマット
- ☐ 紙形式
- ☐ 電子形式

c．提出時期
- ☐ 出願時の国際出願に含まれていたもの
- ☐ この国際出願と共に電子形式により提出されたもの
- ☐ 出願後に、調査のために、この国際調査機関に提出されたもの

4．☐ さらに、配列表又は配列表に関連するテーブルを提出した場合に、出願後に提出した配列若しくは追加して提出した配列が出願時に提出した配列と同一である旨、又は、出願時の開示を超える事項を含まない旨の陳述書の提出があった。

5．補足意見：

国際調査機関の見解書

国際出願番号 ＰＣＴ／ＪＰ２００８／０５５０７８

第Ⅴ欄 新規性、進歩性又は産業上の利用可能性についてのＰＣＴ規則43の2.1(a)(i)に定める見解、それを裏付ける文献及び説明

1． 見解

新規性（N）	請求の範囲	9,12-14,16,19,20,22	有
	請求の範囲	1-8,10,11,15,17,18,21,23-25	無
進歩性（ＩＳ）	請求の範囲	13,16,20	有
	請求の範囲	1-12,14,15,17-19,21-25	無
産業上の利用可能性（ＩＡ）	請求の範囲	1-25	有
	請求の範囲		無

2． 文献及び説明

この国際出願に対する国際調査報告で、以下の文献が提示された。

文献1： JP 11-193282 A（住友製薬株式会社）1999.07.21
文献2： WO 2004/029054 A1（住友製薬株式会社）2004.04.08
文献3： WO 1999/28321 A1（住友製薬株式会社）1999.06.10
文献4： JP 2007-504232 A（アナディス　ファーマシューティカルズ　インク）2007.03.01
文献5： WO 2006/129784 A1（独立行政法人理化学研究所）2006.12.07
文献6： JP 2004-137157 A（住友製薬株式会社）2004.05.13
文献7： WO 2005/092892 A1（住友製薬株式会社）2005.10.06
文献8： WO 1998/01448 A1（株式会社ジャパンエナジー）1998.01.15
文献9： JP 11-180982 A（株式会社ジャパンエナジー）1999.07.06
文献10： WO 2002/085905 A1（株式会社ジャパンエナジー）2002.10.31

(i)請求の範囲1-8,10,11,15,17,18,21,23-25に係る発明は、文献1又は2に対して新規性及び進歩性を有しない。

文献1又は2には、それぞれ本願の上記各請求の範囲に記載の式(1)の化合物の7,8位互変異性体であって、L^2-NR^2R^3に該当する基が置換もしくは無置換のカルバモイル基、すなわち、L^2中のメチレン基がカルボニル基で置き換えられた基、である化合物、及び該化合物を有効成分として含有するウイルス性疾患、又は癌を治療するための医薬組成物が具体的に記載されている（文献1,2:実施例、請求の範囲参照）。

(ii)請求の範囲1-12,14,15,17-19,21,23-25に係る発明は、文献2に対して進歩性を有しない。

文献2には、本願の式(1)のAとしてピリジン環を、L^2-NR^2R^3として置換ピペラジン環、置換アミノ基をそれぞれ選択し得ることも記載されている（請求の範囲参照）。

文献2には、上記置換アミノ基として、シクロアルキルアミノ基、又はアリールアミノ基は例示されていないが、シクロアルキルアミノ基、又はアリールアミノ基は、アミノ基、（ジ）アルキルアミノ基と同様に有機合成化学の技術分野における汎用の置換アミノ基である。

（補充欄に続く）

国際調査機関の見解書

国際出願番号　ＰＣＴ／ＪＰ２００８／０５５０７８

第Ⅵ欄　ある種の引用文献

１．　ある種の公表された文書（ＰＣＴ規則43の2.1及び70.10）

出願番号 特許番号	公知日 （日．月．年）	出願日 （日．月．年）	優先日（有効な優先権の主張） （日．月．年）
WO 2007/034917 A1 [E, X]	29.03.2007	22.09.2006	22.09.2005
WO 2007/034817 A1 [E, X]	29.03.2007	20.09.2006	22.09.2005

２．　書面による開示以外の開示（ＰＣＴ規則43の2.1及び70.9）

書面による開示以外の開示の種類	書面による開示以外の開示の日付 （日．月．年）	書面による開示以外の開示に言及している書面の日付（日．月．年）

第Ⅷ欄　国際出願に対する意見

請求の範囲、明細書及び図面の明瞭性又は請求の範囲の明細書による十分な裏付についての意見を次に示す。

＜請求の範囲の記載について＞

[1]請求の範囲1,12における「置換・・・」、又は「置換されていてもよい・・・」とは、各々具体的にどのような官能基により置換されているのかが不明確である。

[2]請求の範囲1,2の式(1)中のL^2の定義における、「アルキレンにおける任意の1ないし3個のメチレン基は、酸素原子、・・・で置き換えられていてもよく」なる記載は、膨大な数のL^2を包含するし、L^2とL^1、A、及び／又はNR^2R^3との組み合わせをも考慮すれば、さらに広範かつ多様な式(1)の化合物を包含するのであるから、先行技術と比較して、本願発明の式(1)の化合物に共通する化学構造上の特徴点を明確に把握することができない。

補充欄

いずれかの欄の大きさが足りない場合

第　　欄の続き

C07D473/00(2006.01)i, A61K31/522(2006.01)i, A61K31/5377(2006.01)i, A61K31/551(2006.01)i, A61P1/04(2006.01)i, A61P3/10(2006.01)i, A61P9/00(2006.01)i, A61P9/12(2006.01)i, A61P11/00(2006.01)i, A61P11/02(2006.01)i, A61P11/06(2006.01)i, A61P11/14(2006.01)i, A61P13/02(2006.01)i, A61P13/08(2006.01)i, A61P13/12(2006.01)i, A61P15/00(2006.01)i, A61P15/10(2006.01)i, A61P17/00(2006.01)i, A61P17/06(2006.01)i, A61P17/14(2006.01)i, A61P19/02(2006.01)i, A61P25/00(2006.01)i, A61P27/00(2006.01)i, A61P27/02(2006.01)i, A61P27/14(2006.01)i, A61P29/00(2006.01)i, A61P31/04(2006.01)i, A61P31/06(2006.01)i, A61P31/10(2006.01)i, A61P31/14(2006.01)i, A61P31/16(2006.01)i, A61P31/18(2006.01)i, A61P31/20(2006.01)i, A61P31/22(2006.01)i, A61P33/02(2006.01)i, A61P35/00(2006.01)i, A61P35/02(2006.01)i, A61P35/04(2006.01)i, A61P37/00(2006.01)i, A61P37/02(2006.01)i, A61P37/08(2006.01)i, A61P43/00(2006.01)i, C07D473/16(2006.01)i, C07D473/18(2006.01)i

補充欄

いずれかの欄の大きさが足りない場合

第 V.2 欄の続き

してみれば、文献2に記載の発明において、上記式(1)のAに該当する基としてピリジン環を、及び／又はL^2-NR^2R^3に該当する基として置換ピペラジン環、又は置換アミノ基として汎用の基であるシクロアルキルアミノ基、若しくはアリールアミノ基を選択したアデニン化合物を製造し、該化合物のウイルス性疾患、癌等に対する治療効果を試験・確認してみることは、当業者にとり自明である。そして、その効果も格別なものとは認められない。

(iii)請求の範囲 1-8, 15, 17, 18, 21, 23-25 に係る発明は、文献 3 に対して進歩性を有しない。

文献 3 には、本願の式(1)の化合物の 7, 8 位互変異性体であって、L^2-NR^2R^3に該当する基のみが異なる化学構造を有する一般式(I)で表される化合物、及び該化合物を有効成分として含有するウイルス性疾患、又は癌を治療するための医薬組成物が具体的に記載されている（実施例、請求の範囲参照)。

文献 3 には、本願の式(1)の化合物の具体例は記載されていないが、上記 L^2-NR^2R^3に該当する一般式(I)中の置換基 R^2 として、カルバモイル基、又は（ジ）低級アルキルカルバモイル基が選択肢として挙げられているのであるから（請求の範囲参照)、当該文献に接した当業者であれば、同様な薬理活性を有する薬剤を提供すべく、上記置換基 R^2 として、カルバモイル基、又は（ジ）低級アルキルカルバモイル基を選択してみることは自明である。そして、その効果も格別なものとは認められない。

(iv)請求の範囲 22 に係る発明は、文献 1-5 に対して進歩性を有しない。

文献 1-3 には、それぞれ本願発明におけるアデニン化合物、及びそれを有効成分として含有する医薬組成物が記載され、該化合物がインターフェロンの産生を誘導することにより、抗ウイルス活性等の薬理作用を示すことが記載されている（文献 1-3:実施例、請求の範囲参照)。

文献 1-3 には、いずれも上記医薬が、TLR7 機能亢進剤であるかどうかについては記載されていないが、文献 4 には、文献 1-3 に記載のアデニン化合物と類似の化学構造を有する化合物が TLR7 リガンドとして作用し、C型肝炎ウイルス感染等のウイルス感染症の治療用途に有用である旨記載され（【特許請求の範囲】、【背景技術】参照)、また、文献 5 には、TLR7 機能亢進により、抗ウイルス免疫に必要なインターフェロンの産生を誘導することが記載されている（背景技術参照)。

してみれば、文献 1-3 のいずれかに記載の発明において、文献 4 又は 5 の記載に基づき、上記化合物の TLR7 機能亢進活性を試験・確認してみることは、当業者にとり自明である。そして、その効果も格別なものとは認められない。

(v)請求の範囲 13, 16, 20 に係る発明は、新規性及び進歩性を有する。

文献 1-10 には、いずれも本願の請求の範囲 13, 16, 20 に記載の化合物、若しくは、その薬学上許容される塩は記載されておらず、かつ、文献 1-10 の記載から当業者にとり自明の事項でもない。

PATENT COOPERATION TREATY

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NOTIFICATION OF TRANSMITTAL
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ON PATENTABILITY
(CHAPTER I OR CHAPTER II
OF THE PATENT COOPERATION TREATY)
(PCT Rules 44*bis*.3(c) and 72.2)

To:

TANAKA, Mitsuo
AOYAMA & PARTNERS, IMP Building, 3-7, Shiromi
1-chome, Chuo-ku, Osaka-shi, Osaka
5400001
JAPON

Date of mailing *(day/month/year)* 01 October 2009 (01.10.2009)	
Applicant's or agent's file reference 668154	**IMPORTANT NOTIFICATION**
International application No. PCT/JP2008/055078	International filing date *(day/month/year)* 19 March 2008 (19.03.2008)
Applicant Dainippon Sumitomo Pharma Co., Ltd. et al	

1. **Transmittal of the translation to the applicant.**

☑ The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter I).

☐ The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter II).

2. **Transmittal of the copy of the translation to the designated or elected Offices.**

The International Bureau notifies the applicant that copies of that translation have been transmitted to the following designated or elected Offices requiring such translation:

EP

The following designated or elected Offices, having waived the requirement for such a transmittal at this time, will receive copies of that translation from the International Bureau only upon their request:

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3. **Reminder regarding translation into (one of) the official language(s) of the elected Office(s).**

The applicant is reminded that, where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability (Chapter II).

It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned within the applicable time limit (Rule 74.1). See Volume II of the PCT Applicant's Guide for further details.

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No. +41 22 338 82 70

Authorized officer

Masashi Honda

e-mail: pt08.pct@wipo.int

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference 668154	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/JP2008/055078	International filing date *(day/month/year)* 19 March 2008 (19.03.2008)	Priority date *(day/month/year)* 20 March 2007 (20.03.2007)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant Dainippon Sumitomo Pharma Co., Ltd.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 10 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☐	Box No. II	Priority
☐	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☐	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☒	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☒	Box No. VIII	Certain observations on the international application

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 22 September 2009 (22.09.2009)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Authorized officer Masashi Honda e-mail: pt08.pct@wipo.int

Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

TRANSLATION

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43*bis*.1)

	Date of mailing *(day/month/year)*
Applicant's or agent's file reference 668154	**FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/JP2008/055078	19.03.2008	20.03.2007

International Patent Classification (IPC) or both national classification and IPC

Applicant
Dainippon Sumitomo Pharma Co., Ltd.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☒ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/JP	Date of completion of this opinion	Authorized officer
Facsimile No.		Telephone No.

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
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Box No. I Basis of this opinion

1. With regard to the **language**, this opinion has been established on the basis of:

   ☒ the international application in the language in which it was filed

   ☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43*bis*.1(a))

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material

      ☐ a sequence listing

      ☐ table(s) related to the sequence listing

   b. format of material

      ☐ on paper

      ☐ in electronic form

   c. time of filing/furnishing

      ☐ contained in the international application as filed

      ☐ filed together with the international application in electronic form

      ☐ furnished subsequently to this Authority for the purposes of search

4. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

5. Additional comments:

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
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Box No. V **Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims	9, 12-14, 16, 19, 20, 22	YES
	Claims	1-8, 10, 11, 15, 17, 18, 21, 23-25	NO
Inventive step (IS)	Claims	13, 16, 20	YES
	Claims	1-12, 14, 15, 17-19, 21-25	NO
Industrial applicability (IA)	Claims	1-25	YES
	Claims		NO

2. Citations and explanations:

The following documents are listed in the ISR for this international application.

Document 1: JP 11-193282 A (Sumitomo Pharmaceuticals Co., Ltd.), 21 July 1999

Document 2: WO 2004/029054 A1 (Sumitomo Pharmaceuticals Co., Ltd.), 08 April 2004

Document 3: WO 1999/28321 A1 (Sumitomo Pharmaceuticals Co., Ltd.), 10 June 1999

Document 4: JP 2007-504232 A (Anadys Pharmaceuticals, Inc.), 01 March 2007

Document 5: WO 2006/129784 A1 (Riken, Japan), 07 December 2006

Document 6: JP 2004-137157 A (Sumitomo Pharmaceuticals Co., Ltd.), 13 May 2004

Document 7: WO 2005/092892 A1 (Sumitomo Pharmaceuticals Co., Ltd.), 06 October 2005

Document 8: WO 1998/01448 A1 (Japan Energy Corp.), 15 January 1998

Document 9: JP 11-180982 A (Japan Energy Corp.), 06 July 1999

Document 10: WO 2002/085905 A1 (Japan Energy Corp.), 31 October 2002

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

(i) The invention as in claims 1-8, 10, 11, 15, 17, 18, 21, and 23-25 is not novel and does not involve an inventive step in relation to document 1 or 2.

Documents 1 and 2 both disclose a compound that is a 7,8 tautomeric form of the compound of formula (1) as set forth in the above claims of the present application in which the group corresponding to L^2-NR^2R^3 is a substituted or unsubstituted carbamoyl group, i.e., a compound wherein the methylene group in L^2 is replaced by a carbonyl group, and documents 1 and 2 specifically disclose a medicinal composition for the treatment of a viral disease or cancer containing that compound as the active ingredient thereof (see documents 1 and 2: examples; claims).

(ii) The invention as in claims 1-12, 14, 15, 17-19, 21, and 23-25 does not involve an inventive step in relation to document 2.

Document 2 indicates that a pyridine ring can be selected as moiety (A) of formula (1) of the present application and a substituted piperazine ring or substituted amino group can be selected as L^2-NR^2R^3 (see claims).

Document 2 does not list a cycloalkyl amino group or an arylamino group as the aforementioned substituted amino group, but a cycloalkyl amino group and arylamino group are substituted amino groups widely used in the technical field of organic synthetic chemistry in the same manner as an amino group and a (di)alkylamino group.

This being the case, in the invention disclosed in document 2 it is obvious to a person skilled in the art to manufacture an adenine compound wherein a pyridine ring is selected as the group corresponding to moiety (A) of formula (1) above and/or a cycloalkyl amino group or aryl amino group,

which are groups widely used as a substituted amino group, or a substituted piperazine ring is selected as the group corresponding to L^2-NR^2R^3; and to test and verify the therapeutic efficacy thereof in relation to viral disease, cancer, and the like. Furthermore, it is found that no particular advantageous effect is provided thereby.

(iii) The invention as in claims 1-8, 15, 17, 18, 21, and 23-25 does not involve an inventive step in relation to document 3.

Document 3 discloses a compound represented by general formula (I) that is a 7,8 tautomeric form of the compound of formula (1) of the present application and has a chemical structure wherein only the group corresponding to L^2-NR^2R^3 is different. In addition, document 3 specifically discloses a medicinal composition for the treatment of a viral disease or cancer containing that compound as the active ingredient thereof (see examples; claims).

Document 3 does not disclose a concrete example of the compound of formula (1) of the present application, but it lists a carbamoyl group or a (di) lower alkyl carbamoyl group as an alternative for substituent R^2 in general formula (I), which corresponds to L^2-NR^2R^3 above (see claims). Therefore, it is obvious to a person skilled in the art who is familiar with document 3 to select a carbamoyl group or a (di) lower alkyl carbamoyl group as substituent R^2 above in order to provide a drug having a similar pharmacological activity. Moreover, it is found that no particular advantageous effect is provided thereby.

(iv) The invention as in claim 22 does not involve an inventive step in relation to documents 1-5.

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Documents 1-3 all disclose the adenine compound of the invention of the present application and a medicinal composition containing the adenine compound as the active ingredient thereof. Documents 1-3 also indicate that the compound exhibits pharmacological action such as antiviral activity by inducing the production of interferon (documents 1-3: examples; claims).

Documents 1-3 do not indicate whether or not the above drug is a TLR7 function enhancer, but document 4 states that a compound having a chemical structure similar to that of the adenine compound set forth in documents 1-3 acts as a TLR7 ligand and is useful in the treatment of viral infections such as hepatitis C virus infection (see claims, background art). In addition, document 5 describes the induction of the production of interferon, which is necessary for antiviral immunity, by a TLR7 function enhancer (see background art).

This being the case, in the inventions disclosed in any of documents 1-3, it is obvious to a person skilled in the art to test and verify the TLR7 function enhancing activity of the above compound based on the disclosures of documents 4 and 5. Moreover, it is found that no particularly advantageous effect is provided thereby.

(v) The invention as in claims 13, 16, and 20 is novel and involves an inventive step.

None of documents 1-10 discloses the compound or pharmaceutically acceptable salt thereof as set forth in claims 13, 16, and 20 of the present application, and this matter is not obvious to a person skilled in the art from the disclosures of documents 1-10.

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

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Box No. VI Certain documents cited

1. Certain published documents (Rule 43*bis*.1 and 70.10)

Application No. Patent No.	Publication date (day/*month*/*year*)	Filing date (day/*month*/*year*)	Priority date (valid claim) (*day*/month/*year*)
WO 2007/034917 A1 [E, X]	29.03.2007	22.09.2006	22.09.2005
WO 2007/034817 A1 [E, X]	29.03.2007	20.09.2006	22.09.2005

2. Non-written disclosures (Rule 43*bis*.1 and 70.9)

Kind of non-written disclosure	Date of non-written disclosure (day/*month*/*year*)	Date of written disclosure referring to non-written disclosure (*day*/month/*year*)

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/JP2008/055078

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

<Wording of the Claims>

[1] The terms "substituted..." or "optionally substituted..." in claims 1 and 12 are unclear regarding the specific functional groups by which they are substituted.

[2] The expression "arbitrary one to three methylene groups in the alkylene are optionally substituted by an oxygen atom..." in the definition of L^2 in formula (1) of claims 1 and 2 includes a huge number of possibilities for L^2. When the combinations of L^2 with L^1, A, and/or NR^2R^3 are considered, the compounds of formula (1) encompass even a broader scope and more diversity. Therefore, it is impossible to clearly understand the characteristic features of the chemical structure that are common to the compounds of formula (1) of the invention of the present application when compared with prior art.

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

C07D473/00(2006.01)i, A61K31/522(2006.01)i,
A61K31/5377(2006.01)i, A61K31/551(2006.01)i,
A61P1/04(2006.01)i, A61P3/10(2006.01)i,
A61P9/00(2006.01)i, A61P9/12(2006.01)i,
A61P11/00(2006.01)i, A61P11/02(2006.01)i,
A61P11/06(2006.01)i, A61P11/14(2006.01)i,
A61P13/02(2006.01)i, A61P13/08(2006.01)i,
A61P13/12(2006.01)i, A61P15/00(2006.01)i,
A61P15/10(2006.01)i, A61P17/00(2006.01)i,
A61P17/06(2006.01)i, A61P17/14(2006.01)i,
A61P19/02(2006.01)i, A61P25/00(2006.01)i,
A61P27/00(2006.01)i, A61P27/02(2006.01)i,
A61P27/14(2006.01)i, A61P29/00(2006.01)i,
A61P31/04(2006.01)i, A61P31/06(2006.01)i,
A61P31/10(2006.01)i, A61P31/14(2006.01)i,
A61P31/16(2006.01)i, A61P31/18(2006.01)i,
A61P31/20(2006.01)i, A61P31/22(2006.01)i,
A61P33/02(2006.01)i, A61P35/00(2006.01)i,
A61P35/02(2006.01)i, A61P35/04(2006.01)i,
A61P37/00(2006.01)i, A61P37/02(2006.01)i,
A61P37/08(2006.01)i, A61P43/00(2006.01)i,
C07D473/16(2006.01)i, C07D473/18(2006.01)i